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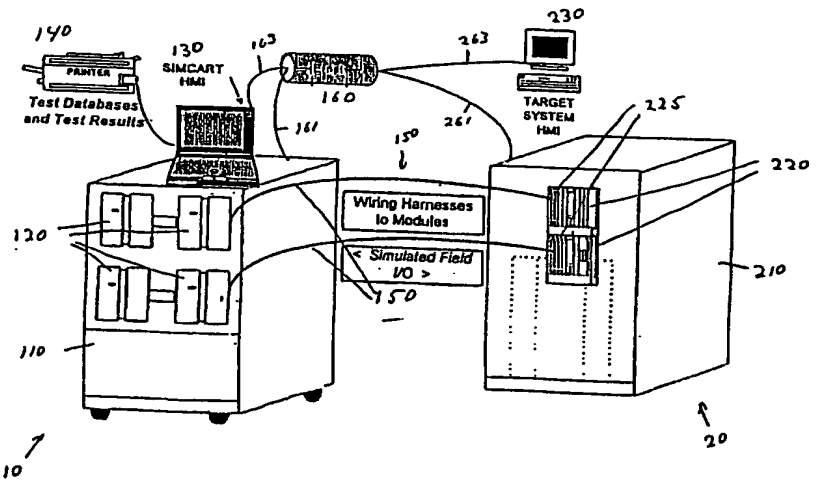

(57) Abstract

A test system (10) is coupled to a control system (20) in a manner which allows the test system to communicate with and drive the control system by sending and receiving signals via both the controller–I/O communication channel (160) and the field I/O connectors (225). The test system (10) is used to both simulate a plant to be controlled and to monitor, validate, and/or modify the internal state of the control system controller and possibly the control system I/O interface (220). Plant simulation is accomplished by simulating the I/O devices to which the control system (20) is coupled (and hence the plant processes) when installed in the operational environment. In addition to the simulation of I/O devices, the test system (10) takes advantage of the fact that many commonly used controller and I/O interfaces are capable of communication with other devices by using such communications ability to provide instructions to or obtain information from a control system's controller(s) and I/O interface(s).